

CLAIMS

1. A liquid crystal display device in
which a pair of substrates having electrodes face
5 each other, and liquid crystal is sealed between the
substrates,

said liquid crystal display device
including an insulating layer that varies electric
field orientations in a pixel region when a voltage
10 is applied between the pair of substrates.

2. The liquid crystal display device as
claimed in claim 1, wherein the insulating layer has
a dielectric constant that is different from a
15 dielectric constant of a surrounding area.

3. The liquid crystal display device as
claimed in claim 1, wherein the insulating layer is
an insulator that has a thickness different from a
20 surrounding area.

4. The liquid crystal display device as
claimed in claim 1, wherein the insulating layer is
formed for each of the substrates, and the
25 insulating layer of one of the substrates is
arranged in a staggered state with the insulating
layer of the other one of the substrates.

5. The liquid crystal display device as
30 claimed in claim 1, wherein a vertical alignment
layer is provided for each of the substrates, and
the liquid crystal is a nematic liquid crystal with
a negative dielectric constant.

35 6. The liquid crystal display device as
claimed in claim 1, wherein the insulating layer is
formed only on one of the substrates, and the

electrode of the other one of the substrates is made narrower than the insulating layer.

- 5 7. The liquid crystal display device as claimed in claim 6, wherein a horizontal alignment layer is formed on each of the substrates, and the liquid crystal is a nematic liquid crystal with a positive dielectric constant.
- 10 8. The liquid crystal display device as claimed in claim 7, wherein the horizontal alignment layers of the pair of substrates are subjected to rubbing in predetermined directions.
- 15 9. The liquid crystal display device as claimed in claim 1, wherein an electric resistance of the insulating layer is higher than an electric resistance of the liquid crystal.
- 20 10. The liquid crystal display device as claimed in claim 1, wherein the electrode of one of the substrate is formed by a metal electrode and used as a reflecting plate.
- 25 11. The liquid crystal display device as claimed in claim 1, wherein the insulating layer is a vertical alignment layer that has a thickness different from a surrounding area.
- 30 12. The liquid crystal display device as claimed in claim 1, wherein an impedance of the insulating layer is lower than an impedance of the liquid crystal or higher.
- 35 13. The liquid crystal display device as claimed in claim 1, wherein the insulating layer is striped.

14. The liquid crystal display device as
claimed in claim 13, wherein a plurality of the
striped insulating layers are arranged adjacently to
5 one another.

15. The liquid crystal display device as
claimed in claim 13, wherein the striped insulating
layer is repeatedly bent by a predetermined length
10 in a zigzag state.

16. The liquid crystal display device as
claimed in claim 14, wherein a plurality of
insulating layers are employed independently of one
15 another.

17. The liquid crystal display device as
claimed in claim 1, wherein the insulating layer
comprises a patterned insulating layer.
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18. The liquid crystal display device as
claimed in claim 1, wherein the insulating layer
comprises patterned structures.

19. The liquid crystal display device as
claimed in claim 18, wherein the patterned
structures are joined to one another.
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20. The liquid crystal display device as
claimed in claim 18, wherein the patterned
structures are independent of one another.
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21. The liquid crystal display device as
claimed in claim 1, wherein the electrodes are
35 arranged in the absence of slits.

22. The liquid crystal display device as

claimed in claim 1, wherein the insulating layer comprises a patterned portion having slits.

23. The liquid crystal display device as
5 claimed in claim 1, wherein the insulating layer comprises a portion which covers at least half the pixel region.

24. The liquid crystal display device as
10 claimed in claim 1, wherein the insulating layer comprises patterned structures that correspond to pixels.

25. The liquid crystal display device as
15 claimed in claim 1, wherein the insulating layer is provided to one of the electrodes.

26. The liquid crystal display device as
20 claimed in claim 1, wherein the insulating layer comprises portions provided to both of the electrodes facing each other.